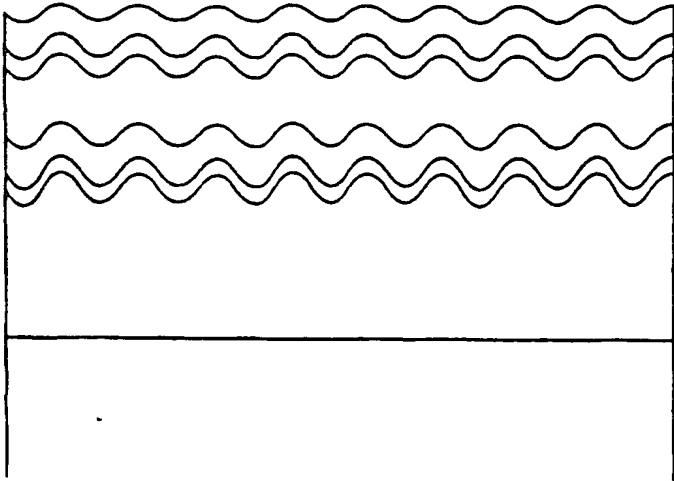




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : H01L 51/20, 33/00</p>	A1	<p>(11) International Publication Number: WO 00/70691</p> <p>(43) International Publication Date: 23 November 2000 (23.11.00)</p>		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>(21) International Application Number: PCT/GB00/01748</p> <p>(22) International Filing Date: 12 May 2000 (12.05.00)</p> <p>(30) Priority Data: 9910901.9 12 May 1999 (12.05.99) GB</p> <p>(71) Applicants (for all designated States except US): UNIVERSITY OF DURHAM [GB/GB]; Old Shire Hall, Durham DH1 3HP (GB). UNIVERSITY OF EXETER [GB/GB]; Northcote House, The Queen's Drive, Exeter EX4 4QJ (GB).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): SAMUEL, Ifor, David, William [GB/GB]; University of Durham, Department of Physics, South Road, Durham DH1 3LE (GB). LUPTON, John, Mark [GB/GB]; University of Durham, Department of Physics, South Road, Durham DH1 3LE (GB). MATTERSON, Benjamin, James [GB/GB]; University of Durham, Department of Physics, South Road, Durham DH1 3LE (GB). BARNES, William, Leslie [GB/GB]; School of Physics, University of Exeter, Physics Building, Stocker Road, Exeter, Devon EX4 4QL (GB). SALT, Martin, Guy [GB/GB]; School of Physics, University of Exeter, Physics Building, Stocker Road, Exeter EX4 4QL (GB).</p> </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>(74) Agent: MARKGRAAF PATENTS LIMITED; The Crescent, 54 Blossom Street, York YO24 1AP (GB).</p> <p>(81) Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p> </td> </tr> </table>			<p>(21) International Application Number: PCT/GB00/01748</p> <p>(22) International Filing Date: 12 May 2000 (12.05.00)</p> <p>(30) Priority Data: 9910901.9 12 May 1999 (12.05.99) GB</p> <p>(71) Applicants (for all designated States except US): UNIVERSITY OF DURHAM [GB/GB]; Old Shire Hall, Durham DH1 3HP (GB). UNIVERSITY OF EXETER [GB/GB]; Northcote House, The Queen's Drive, Exeter EX4 4QJ (GB).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): SAMUEL, Ifor, David, William [GB/GB]; University of Durham, Department of Physics, South Road, Durham DH1 3LE (GB). LUPTON, John, Mark [GB/GB]; University of Durham, Department of Physics, South Road, Durham DH1 3LE (GB). MATTERSON, Benjamin, James [GB/GB]; University of Durham, Department of Physics, South Road, Durham DH1 3LE (GB). BARNES, William, Leslie [GB/GB]; School of Physics, University of Exeter, Physics Building, Stocker Road, Exeter, Devon EX4 4QL (GB). SALT, Martin, Guy [GB/GB]; School of Physics, University of Exeter, Physics Building, Stocker Road, Exeter EX4 4QL (GB).</p>	<p>(74) Agent: MARKGRAAF PATENTS LIMITED; The Crescent, 54 Blossom Street, York YO24 1AP (GB).</p> <p>(81) Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p>
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<p>(54) Title: LIGHT EMITTING DIODE WITH IMPROVED EFFICIENCY</p> <div style="display: flex; align-items: center; margin-top: 20px;">  <div style="margin-left: 10px;"> <p>A1 200 nm</p> <p>Ca 30 nm</p> <p>MEH-PPV 150 nm</p> <p>PEDT</p> <p>Au 18 nm</p> <p>Photoresist 400nm</p> <p>Silica Subtrate</p> </div> </div>				
<p>(57) Abstract</p> <p>An LED, and in particular an LED employing emissive semi-conductors such as conjugated polymeric materials, consists of a pair of electrodes, one or more intermediate semi-conductor layers arranged therebetween and optionally one or more further layers, and incorporates a microstructured feature adapted to manipulate spontaneous emission or propagation of light. The invention also consists of a method for the production of such an LED and the use of such a LED as an light emitting display.</p>				